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is hereby appropriated out of the general revenue of the State; provided that said mineral survey of the State shall be completed within two years."

Section 8 repeals all laws in conflict with the Act, and Section 9 declares an emergency.

It is the intention of the Board of Regents to immediately institute the work of the survey, which will probably be under the direction of Dr. William B. Phillips, who is in charge of economic and field geology in the University.

FREDERIC W. SIMONDS.

SCHOOL OF GEOLOGY,

UNIVERSITY OF TEXAS, April 6, 1901.

PROPOSED SURVEY OF THE ANTIQUITIES OF MICHIGAN.

THE following bill has been introduced in the Michigan Legislature, was reported favorably by the Committee on State Affairs, and is at present referred to the Committee on Ways and Means. An amendment limiting the survey to two years has been made.

The people of the State of Michigan enact:

SECTION 1. That a survey of the antiquities of Michigan be, and the same is hereby established.

SECTION 2. That the survey shall be in charge of a commission comprising the Governor of the State *ex-officio*, the President of the University of Michigan, the President of the Michigan Academy of Sciences, the President of the Pioneer and Historical Society and the President of the Detroit Archeological Society; this commission to serve without compensation, but to be reimbursed for their actual and necessary expenses.

The commission shall have the power to employ an archeologist and one or more assistants and to make such incidental expenditures as the nature of the work may require. The accounts for salaries and other expenses provided herein shall be paid upon the warrant of the Auditor-General monthly, upon the approval of the Governor. At the end of each fiscal year the commission shall cause to be made an annual report, the copy for which, as soon as completed, shall be forwarded to the clerk of the Board of State Auditors for publication by the State printer, the expense of such publication to

be paid from the general fund of the State upon the allowance of the Board of State Auditors.

SECTION 3. For the purpose of carrying out the provisions of this act, exclusive of the cost of publishing the annual reports, there is hereby appropriated from the general fund of the State for the fiscal year ending June thirty, nineteen hundred and two, and each fiscal year thereafter, the sum of two thousand five hundred dollars.

THE DAVENPORT ACADEMY OF SCIENCE.

THE annual meeting of the Academy was held on January 25th in Davenport, Iowa. The reports for the year were most encouraging.

We learn from Mrs. Mary L. D. Putnam, President of the Academy, that the Academy has purchased the corner property adjoining its present building and converted the church into a most attractive lecture hall; the high basement makes a fine room to relieve the former crowded museum. The two buildings are connected by a spacious and well-lighted passageway which may also be utilized for museum purposes.

The scientific library of 10,800 bound volumes has been completely catalogued exclusive of a large collection of pamphlets. The library has been acquired by the exchange of the proceedings of the Academy with home and foreign scientific societies.

The Academy is one of the oldest of the scientific institutions in the West, and on December 14, 1900, celebrated the 33d anniversary of its founding by the dedication of Science Hall. President MacLean and Professor Nutting of the State University of Iowa made addresses, and Professor Starr, of the University of Chicago, gave a lecture 'Among Mexican Indians.'

It is planned to give free scientific lectures from time to time in this hall.

With its large museum, especially rich in archeology and enlarged by the recent gift of the rare Griswold College Collection, including 2,000 scientific books, and with its valuable property, the Academy is on a permanent basis, needing only an addition to its general endowment fund.

The publication is assured by the Putnam Memorial Fund. The income of this fund of

\$10,000 has enabled the Academy this last year to bring out Volume VII., containing 316 pages and seventeen full-page plates.

PROPOSED JOURNAL FOR THE STATISTICAL STUDY OF BIOLOGICAL PROBLEMS.

It is proposed to establish a *Journal of Biological Statistics* which may serve as a means not only of collecting under one title biological data of a kind not systematically collected or published in any other periodical, but also of spreading a knowledge of such statistical theory as may be requisite for their scientific treatment. The following remarks are offered in justification of this proposal:

A very few years ago, all those problems which depend for their solution on a study of the differences between individual members of a race or species were neglected by most biologists. The complexity of organic structure is so great, and the number of distinguishable forms so enormous, that morphologists were obliged to simplify their conceptions by constructing for every species an ideal type, to which the individuals composing it conform with more or less exactness, and to neglect those deviations from the type which actually occur. Such simplification was not only justifiable, but absolutely necessary for many purposes; it has rendered enormous service to biology in the past, it does so still and will continue to do so; nevertheless, there are many problems which can not be dealt with by its aid.

The starting point of Darwin's theory of evolution is precisely the existence of those differences between individual members of a race or species which morphologists for the most part rightly neglect. The first condition necessary, in order that any process of natural selection may occur among a race or species, is the existence of differences among its members; and the first step in an enquiry into the possible effect of a selective process upon any character of a race must be an estimate of the frequency with which individuals, exhibiting any degree of abnormality in respect to that character, occur. The unit, with which such an enquiry must deal, is not an individual but a race, or a statistically representative sample of a race; the result must

take the form of a numerical statement, showing the relative frequency with which the various kinds of individuals composing the race occur.

As it is with the fundamental phenomenon of variation, so it is with heredity and with selection. The statements that certain characters are selectively eliminated from a race can only be demonstrated by showing statistically that the individuals which exhibit that character die earlier, or produce fewer offspring, than their fellows: while the phenomena of inheritance are only by slow degrees being rendered capable of expression in an intelligible form as numerical statements of the relation between parent and offspring, based upon statistical examination of large series of cases, are gradually accumulated.

These, and many other problems, involve the collection of statistical data on a large scale. That such data may be rendered intelligible to the mind, it is necessary to find some way of expressing them by a formula, the meaning of which can be readily understood, while its simplicity makes it easy to remember. The recent development of statistical theory, dealing with biological data on the lines suggested by Mr. Francis Galton, has rendered it possible to deal with statistical data of very various kinds in a simple and intelligible way, and the results already achieved permit the hope that simple formulæ, capable of still wider application, may soon be found.

The number of biologists interested in these questions, and willing to undertake laborious statistical enquiries, is already considerable, and is increasing. It seems, therefore, that a useful purpose would be served by a journal especially devoted to the publication of statistical data, and of papers dealing with statistical theory. Many persons are deterred from the collection of such data, by the difficulty of finding such a means of publishing their results as this journal would afford, and those results which are published frequently lose much of their value because the data on which they are based are withheld, or because they are isolated in publications largely devoted to other forms of investigation.

It is suggested that '*Biometrika*, a Journal for